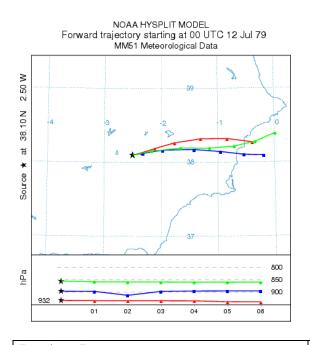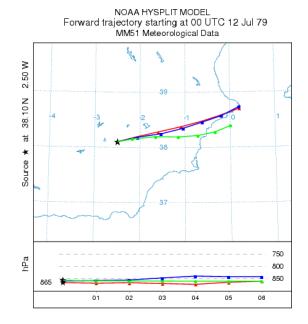# Terrain Height

The trajectory starting height is defined as AGL (above ground level). Height definitions can be changed to MSL (mean sea level) from the "advanced, configuration" menu tab. Regardless of how the input heights are defined, internally HYSPLIT treats all heights in a terrain following coordinate system. The terrain values are those of the meteorological data. These may be quite different from the actual terrain height at a point of interest. As an example of how one might define a starting trajectory, examine the location 38.1N and 2.5W. Using the profile program, the terrain heights at that location for several of the different data sets can be determined.

Model	Resolution	Terrain
MM5	12 km	1450 m
MM5	36 km	1081 m
MM5	108 km	816 m
ECMWF	2.5 deg	364 m
NOAA	2.5 deg	400 m

Assume the 12-km data to be the base case (the most accurate), then the isobaric trajectories (to minimize vertical motion effects) from 10 m AGL for each MM5 data sets is shown to below left. Although the data have the same vertical resolution, and the trajectories start out at the same height AGL, they start at different pressure levels due to differences in elevation between the data. The 36-km (blue) and 12-km (green) trajectories are the most similar. In the second example, the initial heights of the 36-km and 108-km (red) simulations were adjusted so that the trajectories start at the same pressure levels and neither one matched the 2-km trajectory. The proper trajectory depends if the interest is related to interactions with the surface or longer-range transport.